Learning Together:
Constructing Knowledge
in a Teacher Research Group

By Colleen M. Fairbanks & Diane LaGrone

As O'Donnell-Allen (2001) notes, teachers, like all learners, extend and expand their understanding of teaching through a variety of socially-mediated contexts. Teacher Research Groups (TRGs) provide one means of creating learning communities among teachers with the express purpose of systematically examining practice and enriching teachers' knowledge about learning and teaching (Cochran-Smith & Lytle, 1993; McLean & Mohr, 1999; O'Donnell-Allen, 2001; Wells, 2001b). These groups meet regularly, may be facilitated by a more experienced peer or university researcher, assist teachers with the development of research questions and methods, and support individual members as they work through the research process (Allen, Cary, & Delagado, 1995; O'Donnell-Allen, 2001). Their purpose is to engage teachers in ongoing reflection and inquiry with respect to practices grounded in teachers' immediate contexts. There has been little study, however, of the processes by which teachers learn in such groups or the ways teachers' participation contributes to their sense of agency (O'Donnell-Allen, 2004). This study examines the discourse of a teacher research group with a focus on the ways in which the teachers constructed knowledge through talk about theory

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and practice during three day-long meetings organized to support their research efforts. Through this investigation, we explore the role that TRGs can play in transforming teachers' knowledge and in developing teachers' agency.

Theoretical Framework

Teacher research comprises a broad range of systematic examinations of classroom practice conducted by teachers (Cochran-Smith & Lytle, 1993). Not simply a means by which teachers might improve their teaching practice (although this might be an outcome of such research), teacher research "can lead to clarifications and enrichments of visions [that guide teaching], and analyses of data can lead to development and/or modifications of the theory, as well as vice versa" (Wells, 2001b, p. 19). From this perspective, teacher research and the groups that support it are means of fostering teacher learning that encompass classroom practice, the theories from which these practices are derived, and the language-mediated learning that attends exploratory talk within a teacher research community. At the same time, teacher research offers teachers opportunities to examine classroom practices within the local contexts in which the teachers themselves carry out their professional lives and with a focus on their specific concerns or questions (Wells, 1994). As Wells (1994) argues, conducting teacher research extends the kinds of reflective practice that characterizes effective teaching by "creating a new dialectical relationship between [theory and practice], as increased understanding is derived from the interpretation of observations of the effect of a deliberately introduced change, and the new understanding is used to plan further change to improve practice, in a never ending spiral" (p. 26).

Wells goes on to argue that this reflective spiral engages teachers in several processes related to learning. First, as teachers conduct studies in their classrooms, they observe, analyze, and interpret the practices that make up the focus of their inquiry. Moreover, they use these research tools to plan and act on their findings (even as they continue to conduct their inquiries). Perhaps more importantly, though, teacher research engages teachers in reading and writing about their practice, enlarging their professional knowledge through text-based study, and it generally engages them in collaboration with their colleagues, garnering feedback and support for their work as well as access to additional perspectives about observations or interpretations. It is within this realm—through collaborative and exploratory talk—that the present study focuses its attention.

Socio-Cultural Concepts of Teacher Learning

Specifically, this study draws on both socio-cultural learning theories and recent studies of discourse analysis for its frame of reference. In line with Vygotsky and his followers, the problem-posing and -solving that characterizes teacher research can be construed as activities by which "knowledge is constructed and reconstructed

between participants in specific situations, using the cultural resources at their disposal, as they work toward the collaborative achievement of goals that emerge in the course of their activity" (Wells, 2001a, p. 180). According to Wells (1999), such knowledge construction occurs as individuals "are engaged in meaning making with others in an attempt to extend and transform their collective understanding with respect to some aspect of a jointly undertaken activity" (p. 84). The process entails the creating and recreating of representations, "those artifacts that are used as mediational means for the related ends of understanding and acting effectively in the world" (p. 68). Drawing on the work of Wartofsky (1979), Wells posits that representations may include tools (which may represent actions as well as objects), practices or skills, and imaginary worlds or theoretical models (e. g., fictional worlds or models of reading comprehension). In the course of joint activity, individuals bring their representations to bear on the topic or problem under consideration with the related aims of understanding the problem and of transforming their current representations. In the context of the TRG, teachers bring to the table their representations of various practices, the tools of their trade (e. g. books and materials, lesson plans, standards documents), and their theories about teaching and learning.

Studying Teacher Talk in a Teacher Research Group

In order to study how teachers negotiate and transform these representations through the TRG—in other words, how they come to know their practices differently—examining the conversations that support their work provides a means of documenting these processes. Using discourse analysis offers an analytical tool to examine how individuals use language to construct knowledge about their experiences, to solve problems, and to revise their understandings. As Mercer (2000) has illustrated, "language allows the mental resources of individuals to combine in a collective, communicative intelligence which enables people to make better sense of the world and to devise practical ways of dealing with it" (p. 6). Mercer (2000) defines the kind of talk that supports creating knowledge as "exploratory talk," talk in which partners "engage critically but constructively with each other's ideas" and through which "reasoning is made visible" (p. 98). Through exploratory talk, people are able to participate in discourses specific to the communities in which they are or aspire to be members (Gee, 1990), explore their perceptions and beliefs, modify existing discourses or acquire new ones (Lave & Wenger, 1991)—all of which contribute to their knowing in relation to the practices and conventions of these communities.

An essential feature of communities of learners centers on Edwards and Mercer's (1987) notion of context and continuity. These two concepts help illustrate how members of a community construct shared notions of context through references to prior spoken and written texts, prior history, artifacts, and shared vocabulary. At any moment in time, speakers evoke topics and ideas for which their audience has a general understanding. Within the specific conversation, however,

these topics or ideas take on "situational reference" that particularize their meanings to the time, place, and circumstances of the current conversation. Over time, situational references become a resource of prior meanings to which members of the group can refer and by which they assume shared understanding of their utterances. These prior meanings, along with the specific discourses practices established concomitantly in shared activity, establish a community as a community.

Thus, an examination of the discourse of a teacher research group can shed light on how a specific group of teachers jointly constructs knowledge about teaching and learning by highlighting the specific discursive methods they use to explore ideas, examine practices, and interpret their experiences. This analysis, in turn, suggests how TRGs might facilitate a teacher's move from "passive consumer of other people's ideas to that of agentive constructors of his or her own knowledge" (Wells, 1994, p. 25).

Context and Method

The teacher researchers who participated in this study shared an affiliation with a National Writing Project site in the southwest. The two directors (Colleen and Valerie), four teachers who had attended the 2002 summer writing institute together (Amanda, Bill, Carol, and Martha), and a graduate student researcher (Letty, who attended the 2003 summer institute) jointly participated in a teacher research group organized because of the interest expressed by the teachers and supported by the writing project site. Six of the participants were female; one was male. Their teaching assignments ranged from second grade to high school, and they taught in two different school districts (three in one district, two in the other). All participants except the graduate student had extensive prior experiences together, evinced compatible if distinct approaches to teaching, and had continued to engage in other professional development projects together. To begin the project, the entire group read *Teacher-Researchers at Work* (McLean & Mohr, 1999) to provide guidance for the research projects the teachers developed and a common language from which we could begin our research efforts.

Colleen's research project consisted of the study presented in this paper and aimed specifically to explore how the teacher research group evolved as a community of practice and the discursive means by which we shared ideas, examined both practical and theoretical issues, and learned from our experiences. A research assistant, Letty, took notes and assisted in the development of analytic categories. Our analysis draws upon discourse analysis (Gee, 1990; Mercer, 2000) and the ethnography of communication (Hymes, 1994) for its methodological base.

Specifically, the three day-long meetings were audio recorded and transcribed. The meetings lasted about six hours and yielded approximately 370 pages of transcript data. In addition, both the research assistant and Colleen took field notes during the meetings, recording observations and summaries of the teachers'

projects, questions, and progress. We began our analysis first from the standpoint of individual idea units, which are defined here as stretches of talk—word, phrases, sentences, etc.—that reflect the speaker's focus of attention (Chafe, 1980) as a way of chunking the data. Our aim was to examine both the content of the idea units and the functions they served in the conversation (i. e., clarifying a point, speculating on the outcome of a teaching practice) by asking ourselves what contribution each idea made to the conversation. We drew upon codes and categories developed elsewhere (Mercer, 2000; O'Donnell-Allen, 2001) as well as codes that emerged from the transcript data. We initially coded independently, then compared our assignment of codes, and clustered them into eleven categories of talk (see Figure 1).

While these eleven categories were useful from a descriptive standpoint, we were interested in how these categories of talk were used in different ways across the teachers' conversations, or, more specifically, how the functions of their talk shifted as a result of topic or purpose. To examine how these categories of talk were used in different ways across the conversations, we divided the transcripts into broad topics. These topics had predictable beginnings as a portion of each meeting was devoted to discussion of each participant's research project, but the course of the conversations varied in response to the questions or issues raised by the teacher researcher reporting within the topic. Discussions of any one project extended across multiple pages of transcript data, necessitating further topical chunking. We divided topics into sub-topics that were roughly equivalent to Mehan's (1979) idea of Topically Related Sets in that they were bounded by clear shifts in the talk and often began with a story or a question that signaled a shift in focus.

Finally, we examined how categories of talk were used to engage in an exploration of topics and topic sets and to contribute to the conversation in which they were embedded. We analyzed both the prevalence and patterns of specific categories of talk, their purposes in relation to the topic under discussion (i. e., Were clarifying questions asked to understand Amanda's classroom context or to understand problem-solving in math?), and the effect the categories of talk had on the flow of the conversation (i. e., How did Amanda's reframing question shape the discussion of Martha's project?). These analytic methods aided us in identifying the ebbs and flows of the teacher researchers' conversations, the patterns of talk specific to individual participants and those common to all, and the nature of the exploratory talk (Mercer, 2000) through which the teacher researchers built new and revised meanings for their teaching and their research.

Findings

We identified eleven distinct forms of talk in our analysis of the transcripts that characterized the ways this group of teacher researchers constructed and reconstructed their knowledge about teaching: (1) reporting, apprising group members about process or events that occurred between meetings; (2) clarifying, asking a

Figure 1. Categories of Talk

Categories	Example from the Transcripts
Reporting: Apprising members of the group about progress or events.	Martha: *And, they took their first grammar test yesterday. Part of it was the identifying because I have to do something like that. The second part was I asked them to write sentences, prescribed sentences. So, like, "You write a declarative sentence using a verb phrase." So, we'll see how that works.*
<u>*Clarifying*</u>: Asking a question or restating an idea in order to better understand someone else's statements or questions.	Amanda: Or, yes, and what I, but I, because I guess what I wanted, was we, to somehow make that transition to help kids understand that connection between math is not just a step, set of steps, that you follow. That there is actually a thinking process. Even though, if I said, "Eight minus four is four," if I said 'There are eight things and four da da da, what is the answer?" they're like, "I don't know." They don't make the connection between the language and the situational aspect, the real world practical… Martha: *So, you would want them to say, "Well, I would need to subtract."*
Explaining: Responding to a clarifying question; elaborating on an idea to help others understand	Martha: Right, of course it can. *But, you know, when you don't have to, if you are trying to persuade someone, you don't have to use logic to do it.*
Speculating: Anticipating the outcome of instructional events that the group is considering.	Carol: *And, I just wanted to see, you know, ah, something that, I don't know if in an informative, I would have to say for fifth grade if I was just guessing, I think those kids are really going to help each other with the narrative because the kids know the stories they are telling, so then they leave out half of the stuff because they know it themselves so well.*
Imagining a Scenario: Using statements or questions to visualize an instructional or research practice without having experienced it.	Colleen: *You know that there is, you could write about a problem as exploring all the different ways you could do something. You could do it from a more informative standpoint of that sort of how-to. How would somebody, if somebody was to encounter a problem like this, how would they solve it? So that if you start thinking about all of the different ways that you might write about and introduce those as part of your, and maybe even do it as the beginning of the week mini-lesson. What we talked about earlier is, "This week, our focus is going to be on all of the ways in which we might solve a problem."*
Offering Instructional Advice: Making suggestions about teaching practices.	Colleen: *So, maybe that would be the thing to do is make sure you have editing conferences where the focus is on conventions….*
Telling Stories about Practice: Using narratives to illustrate a point or to suggest another way of seeing the topic at hand.	Amanda: *But, like I gave them, like I told them, I didn't bring the stupid math problem that goes with it, but, it was like a, basically it was like five pictures and it said "The hat is white. It doesn't have a da da da." You know what I mean, and they had to figure out which hat it was.*

Categories	Example from the Transcripts
Redirecting: Changing the focus of the conversation by introducing a new topic or by refocusing the conversation after a digression	Colleen: Well, but maybe, that is the way to think about it, too, is almost like genres. You know that there is, you could write about a problem as exploring all the different ways you could do something. You could do it from a more informative standpoint of that sort of how-to. How would somebody, if somebody was to encounter a problem like this, how would they solve it? So that if you start thinking about all of the different ways that you might write about and introduce those as part of your, and maybe even do it as the beginning of the week mini-lesson. What we talked about earlier is, "This week, our focus is going to be on all of the ways in which we might solve a problem." Amanda: *OK, so data collection, I was wondering if I should just have them do all of their writing in the same place.*
Reframing: Using a question or making a comment that redefines the topic at hand; the questions extend the discussion beyond the teacher research project being discussed.	Valerie: In other words, those kids are not misusing some of the things that you're trying to teach them the rules of. Martha: No, they're not. They're not. You mean like verbs and nouns, and that kind of thing? They're not doing that. Valerie: Right. *So, then the question becomes, why is it important? And I am just going to use a sixth grade example from my son. Why is it important to be able to label collective versus compound nouns?*
Supporting: Offering support to the speaker to build community or to express empathy.	Amanda: But I gave them that formula. You know what I mean like I said, "I want you to tell me 'I know.' Tell me why each of the ones aren't the answer and then tell me why the one… Martha: *But that is OK.*
Affirming.	Amanda: Is that OK? Martha: *I think so.* Colleen: *Sure.*

Note: Italicized text indicates the part of the talk that illustrates the category.

question or restating an idea in order to better understand the speaker's intention; (3) explaining, responding to a clarifying question or elaborating on an idea to help other understand; (4) speculating, anticipating the outcome of instructional events that the group was considering; (5) imagining a scenario, envisioning how a practice might occur in a classroom setting; (6) instructional advice, offering ideas about teaching practices related to the research questions; (7) telling stories, using narratives to illustrate a point or to suggest another way of seeing the topic at hand; (8) redirecting, changing the focus of the conversation by introducing a new topic or by refocusing the conversation after a digression; (9) reframing, asking "refracting questions" (O'Donnell-Allen, 2001) or making a comment that redefines the topic at hand; (10) supporting, making a comment or response aimed at building community among the group or showing support for the person's reported actions;

and (11) affirmations, offering feedback to the speaker that the listener/responder had heard and understood the previous utterance (see Figure 1 for examples from the transcripts).

The analysis indicated that the teachers' use of these forms of talk interacted in complex ways to support teacher reflection and the transformation of their understanding of research and practice. To illustrate how talk and learning coincided, we examine closely transcriptions of two discussions that took place during one of the early group meetings. In general, the conversations among this group were marked by overlapping talk, multiple simultaneous conversations, as well as extended conversation around a central topic. However, the two conversations—Amanda's study of the use of math journals and Martha's study of grammar—demonstrate two distinctly different ways by which the teachers revised their representations of research and practice through talk aimed at solving the questions teachers raised about their individual projects. They also point to the potential of exploratory talk to help teachers address the questions and dilemmas that arise from the specific contexts of their practice.

Amanda's Study of Math Journals

This conversation took place at the first formal meeting of the TRG in September. The meeting began with a discussion of each of the six members' research project ideas and the questions they were pursuing. Amanda's area of research focused on using journals with her second-grade students to examine their problem-solving strategies. The discussion illustrates how the teachers constructed knowledge by "using and progressively improving" their representations of writing pedagogy, designing research, and the nuances of simultaneously teaching and conducting research (Wells, 1999, p. 84). The conversation included her description of the project, the work she had done with her students, her initial impressions of their journal writing, and the TRG members' suggestions for both her teaching and her research. Amanda began the conversation by reporting her struggle in forming a research question:

1   Amanda: What I am struggling with is how to phrase my question. *[Reporting]* What
2   I would like to know is how much writing in math or if writing in math will increase
3   students understanding of problem solving, but I don't know how we could possibly
4   ever show that because wouldn't their understanding of problem solving just from any
5   teaching hopefully improve. I mean . . . *[Explaining]*

6   Valerie: So you don't have comparison groups? *[Clarifying]*

7   Amanda: Well, you couldn't have that. *[Explaining]*

8   Valerie: Well, I know you can't. *[Clarifying]*

9   Amanda: Right, I can't have a comparison group *[Affirming]*, and I don't know how I
10   phrase like . . . *[Clarifying]*

11   Colleen: Maybe the question should be more descriptive. *[Clarifying]*

12   Amanda: Like? *[Clarifying]*

13   Colleen: Well, rather than comparative, so that the question is, might be something
14   more around how do kids use writing to problem solve or what evidence do I see in
15   their writing of problem solving and can I characterize the kinds of writing or problem
16   solving they do in their writing. *[Explaining]* Or, I mean, I am, so that if it is more
17   descriptive you know that you are going to describe what you see in their writing
18   about mathematics. *[Explaining]* You might be able to come, it won't be whether or
19   not they do more or less than if you taught them some other way, but to be able to
20   characterize the kinds of problem solving strategies they use, or I am not exactly sure
21   what it, problem solving in writing, would look like. *[Explaining]*

In response to Amanda's question, Valerie and Colleen explored possibilities for research questions that would not require experimental methods through a series of clarifying questions. In her last turn, Colleen provided concrete examples of questions that Amanda might ask, suggesting as well other ways of understanding how research might be conceived.

The ensuing conversation explored what an investigation of such questions might yield and how Amanda might proceed. Across these exploratory conversations, the teachers consistently offered suggestions about professional literature that might assist the researcher, and this conversation was no exception. Valerie first introduced such literature into this conversation by referring to Burns' (1995) work in developing young students' math abilities. It was through this discussion that Amanda first voiced her concerns about the math journals that her students had written:

22   Amanda: Well, she [Burns] has tons of stuff. I mean she does mostly, I mean her
23   math instruction is all completely concept development where they do, they come up
24   with, I mean they develop their own concept basically by playing with manipulatives
25   and other kinds of things. *[Reporting]* And now we do a lot of that, so there is a lot of
26   opportunities for them to write about what they are doing, but what I have found is
27   that they don't know how to write about it. *[Reporting]*

28   Valerie: Right. *[Affirming]*

29   Amanda: They just write, "I did this, this, this, and this." Well, it is like, "Well why
30   did you do that? Why did you think you need?" *[Reporting]*

31   Valerie: "What were you thinking when you…" *[Affirming]*

32   Amanda: Right, what were you thinking? *[Affirming]* And I, and so, that is where
33   also it is like teaching them how to write about math. *[Clarifying]*

34   Bill: Yeah, see that is the problem. *[Affirming]*

35   Colleen: There is another that is an additional question or a tandem question . . . *[Clarifying]*

36   Bill: What? *[Clarifying]*

37   Colleen: …teaching them… *[Explaining]*

38   Amanda: Teaching them how to . . . *[Clarifying]*

39   Carol: …to talk about math. *[Clarifying]*

40   Colleen: …how to write about mathematics. *[Clarifying]*

41   Amanda: …then does that show up in their writing? Or, do I teach them how to write?
42   *[Clarifying]*

Here Amanda began by reporting her understanding of Burns' (1995) work and then relating it to her experiences with her second-graders and their difficulties writing about math, which she explained in line 26 and which Valerie echoed as a way to affirm Amanda's explanations in the following line. Amanda's conclusion (lines 32-33) was that her project entailed not just exploring what students wrote but also teaching them *how* to write about math. This conclusion led to a series of overlapping exchanges as the group tried to make sense of it, with Colleen suggesting that *teaching* students to write about math implied a different question than exploring what students wrote independent of instruction. The exchange then ended with Amanda wondering which question she should explore: "So, teaching them how to talk about mathematics, then does that show up in their writing? Or, do I teach them how to write?"

The group took up her questions by discussing the implications of teaching the students to write about math. They jointly constructed a scenario that focused on providing students with an oral model of a problem-solving strategy before they wrote about it. However, this imagining failed to help Amanda, as she had already changed her instruction to include providing students with models:

45   Amanda: But, like I gave them, like I told them, I didn't bring the stupid math problem
46   that goes with it, but, it was like a, basically it was like five pictures and it said "The
47   hat is white. It doesn't have a da da da." You know what I mean, and they had to
48   figure out which hat it was. And I said, "I want you to tell me what you know, and
49   what you, and so why that doesn't work." And so they were like, "I know the feather
50   hat doesn't cover his ears. The boat hat doesn't belong because it doesn't have an
51   animal on it, and the animal hat isn't it because it only has one button. *[Telling Stories]*

52   Colleen: That's great. *[Affirming]*

53   Amanda: But I gave them that formula. *[Clarifying]* You know what I mean like I
54   said, "I want you to tell me 'I know.' Tell me why each of the ones aren't the answer
55   and then tell me why the one" . . . *[Explaining]*

56   Martha: But that is OK. *[Supporting]*

57   Amanda: Is that OK? *[Clarifying]*

58   Martha: I think so. *[Affirming]*

59   Colleen: Sure. *[Affirming]*

60   Martha: Because you are trying to teach them how to respond. *[Explaining]* You
61   know if you give them that fill in the blank kind of thing at least it gets them thinking
62   about how they came up with that problem, how they came up with that solution. And
63   then, as time goes on, you can say, "OK, now tell me how you came to that solution?"
64   without giving them that because they already had practice doing it. *[Imagining]*
65   Don't you think? *[Clarifying]*

Specifically in this excerpt, Amanda related a classroom story intended to provide a mental context for the group members to illustrate how she had already altered her instruction (cf., Mercer, 2000). In subsequent turns, the teachers used affirmations, supporting comments, and clarifying questions first to endorse Amanda's decision to "teach" problem-solving through a series of models rather than simply observing her students' problem-solving in their journal writing and second to explore the implications of this decision (lines 52-64). Martha's scenario at the end of the exchange provided a possible representation of this process, in this case a narrative of practice to illustrate her thinking, and implied an avenue for research based on this narrative.

In her next turn (lines 66-68 below), however, Amanda attempted to define her purposes more clearly, speculating on the instructional outcome she wanted for her students. Colleen followed with a scenario for research that Martha supported by both joining and checking it against Amanda's purposes. Amanda seemed to resist these suggestions, however, maintaining the focus on her instructional goals and engaging in a series of nested explanations in which each idea unit aimed to clarify the previous one as she worked to articulate through her students' difficulty writing about their problem-solving practices. The excerpt ends with a series of scenarios that members of the group offered again as a means of both checking and supporting Amanda's explanation of the instructional problem.

66   Amanda: Well, because I guess the whole end purpose here is so that when I give you
67   a variety of problem solving things and you have to make a decision about how to
68   solve it and it is multi-step, can you take yourself through that process? *[Speculating]*

69   Bill: Right. *[Affirmation]*

70   Colleen: Well, then that is what you would want to look at is, I mean, is if you're
71   teaching them all these different strategies about how to do problems and asking them
72   to outline, you know to write them down how they solved it using a particular model,
73   then one of the things that you might want to look at is when you give them a variety
74   of problems and you ask them to do the same thing you can see which strategies they
75   apply to what problems. *[Imagining a Scenario]*

76   Martha: And hopefully you'll see which math strategies that they are using.
77   *[Imagining a Scenario]* I mean, isn't that what you want to know. *[Clarifying]*

78   Amanda: Or, yes, *[Affirmation]* and what I, but I, because I guess what I wanted, was
79   we, to somehow make that transition to help kids understand that connection between
80   math is not just a step, set of steps, that you follow. That there is actually a thinking

81   process. You know to make that a cognitive, *[Explaining]* like a lot of kids can add or
82   subtract, but when you put it in a word problem and you give them a situation, they
83   don't know whether to add or to subtract. *[Explaining]* Do you see what I mean, like
84   they have no clue? *[Clarifying]* Even though, if I said, "Eight minus four is four," if I
85   said, "There are eight things and four da da da, what is the answer?" They're like, "I
86   don't know." They don't make the connection between the language and the
87   situational aspect, the real world practical . . . *[Explaining]*

88   Martha: So, you would want them to say, "Well, I would need to subtract." *[Clarifying]*

89   Amanda: Or, to be able to say, "OK, if there's…," be able to even visualize. *[Explaining]*

90   Martha: Right. *[Affirmation]*

91   Valerie: "If there are eight here, and I take away four" . . . *[Imagining a Scenario]*

92   Amanda: Draw a picture of it . . . *[Imagining a Scenario]*

93   Valerie: Then that leaves four behind. *[Imagining a Scenario]*

94   Martha: And, I am just thinking of it from a seventh grade perspective because they
95   have problem solving also and what the teachers struggle with is, well you know, how
96   did you get to your answer? *[Supporting]*

97   Amanda: Right, *[Affirmation]* where did it come from? *[Clarifying]*

98   Martha: Where did it come from? "Well, I just figured it out." Well, you need to tell
99   me how. *[Imagining a Scenario]*

The patterns of talk here indicated that the teachers worked to construct knowledge of Amanda's classroom, her interests in studying students' problem solving, and how she might balance her research and practice for the good of her students. The teachers used clarifying questions and statements as well as imagined scenarios to create representations of classroom interactions that served both to indicate how they understood her questions as well as to offer alternative possibilities for subsequent actions.

Throughout this discussion, the participants brought their knowledge of classroom practice, research, and students' learning to the discussion of Amanda's project. The talk was exploratory in Mercer's (2000) sense in that members engaged in collective inquiry with and co-construction of a mental context with Amanda in an effort to help her make decisions about how she should proceed. Moreover, these types of talk acted as tools through which the participants mediated between their general understandings of writing and math and the specific contexts of Amanda's classroom. Their discourse thus contained the common features of problem solving: a problem, tools, co-participants, and a practice modified to address the problem (Wells, 1999). It was also aimed at resolving Amanda's dilemma by balancing her research project and her observations of students' instructional needs. Thus, the group worked collectively to re-envision Amanda's teaching and her research by learning about her classroom context and offering alternate research possibilities.

Martha's Study of Grammar

A seventh-grade language arts teacher, Martha engaged in a multiyear interest in grammar instruction, prompted by the expectations of high school teachers in her district who believed students should know parts of speech and by the new instructional methods she had learned about during the summer writing institute. At the start of the TRG, she had implemented some of these instructional ideas (e. g., a reflective letter about students' writing, a grammar reference book for children) but still struggled with students' apparent inability to demonstrate mastery on quizzes and tests. To begin the topic, Martha reported what she had done and the difficulties students encountered identifying parts of speech on a recent quiz. In the following excerpt, Colleen used a redirecting question to change the focus to her research project:

1   Colleen: That is what you're doing, but what are you, how are you studying it? *[Redirecting]*

2   Carol: What are you thinking you want to find out? *[Explaining]*

3   Colleen: Yeah. *[Affirming]* What sorts of questions are you pursuing? *[Explaining]*

4   Martha: See, and that is where I was having a lot of self-doubt, already. You know?
5   *[Clarifying]*

6   Colleen: Self-doubt is a good thing, right? If you're confused that means you're
7   learning. *[Supporting]*

8   Martha: It just seems like, I don't know. I don't know if I have everything.
9   *[Explaining]* You know, I am looking at that book, you know, and when I was
10   talking to the kids, I said, "Do the verbs with ING endings." You know, that is a good
11   visual thing we can do. But, that is on conferencing. I mean, grammar is like
12   throughout, yeah, that is what I am reading. *[Reporting]*

In her last turn above, Martha represented her concern in terms of the adequacy of her instruction. The underlying question seemed to be: "Is teaching grammar through revision, as authors such as Noden (1999) advocate, enough to meet her instructional obligations?" She did not, in this turn, address her research question because, it seemed, her questions about instruction precluded her ideas about her research and the competing theories about grammar instruction that fueled her concern. These theories and their relationship to her research surfaced more explicitly shortly afterward when Amanda redirected the conversation by asking, "Well, is your question about does it improve their understanding of grammatical [concepts], or does it show up in their writing?" *[Redirecting]*. This question pointed to the underlying tension in Martha's conception of grammar instruction, that is, knowing and naming grammatical concepts and the role of grammar in learning to write more effectively. As will be seen later in the conversation, this question led to a broader discussion about the purposes of grammar instruction across an array of settings, engaging the TRG in jointly constructing a representation of the varied uses of grammar in the writing classroom.

Martha indicated that she was most concerned with students' use of syntax and punctuation in their writing, stating, "That is what I would really like to know, how they're understanding of concepts can carry over into their writing" and articulating her goal: "That is what I want them to do eventually is to be able to say, 'Well, I purposely did this.'" In this statement, Martha appeared to blend the two possibilities Amanda offered, that is, that students would be able to use grammatical constructions both correctly and purposefully in their writing. However, as the conversation continued, Amanda returned to the purpose of grammar instruction more broadly by connecting it to her own writing development. The excerpt that follows illustrates how Amanda came to her reframing question by "thinking out loud":

13 Amanda: Do you remember, though, Bill, this summer, when I had that sentence in
14 my piece, and could, for the life of me, could not figure out how to punctuate it? *[Reporting]*

15 Bill: Right, right. *[Affirmation]*

16 Amanda: Do you know what I mean? *[Clarifying]* Like, I mean, I wonder how much
17 of it isn't so much being able to, I mean, I am just thinking of my own personal, I
18 mean, I can write, but I am, I know nothing, like you guys start talking about all of
19 this stuff, and I don't know what those things are. *[Explaining]* And, I didn't even
20 really understand very much about punctuation until I was in graduate school, I mean
21 really, I mean, I started to actually internalize some punctuation rules because I had
22 made the mistake over and over again. *[Reporting]* I could still write the sentence
23 though. So I wonder, how much, I don't, whether I could write much more
24 sophisticated things. And so . . . *[Redirecting]*

25 . . . [digression in the conversation]

26 Amanda: … and a lot of kids do that, and that's how I, and that is the thing is, I don't
27 go through and see how can I go through and see how can I revise this with my
28 grammar to make it better. I go through with . . . *[Explaining]*

29 Valerie: How does it sound? *[Clarifying]*

30 Amanda: . . . sound when I read it out loud. *[Affirming]*

31 Martha: But, on the other hand, I am faced with the high school teachers . . .
32 *[Redirecting]*

33 Amanda: Right, I know *[Affirming]*, but that is what I'm wondering *[Clarifying]*, I
34 understand that, having to teach it *[Affirming]*, but, I am just trying to think about how
35 to show, how can you, like, would I have understood, would I have been a better
36 writer today if I had understood grammar in high school, or would I be the same
37 writer I am today . . . *[Reframing]*

38 Colleen: Only more accurate? *[Clarifying]*

39 Amanda: Only just more accurate with my punctuation marks? *[Affirming]* That is
40 where I am wondering how you are going to show . . . *[Clarifying]*

41 Bill: Improvement? *[Clarifying]*

42   Amanda: . . . improvement in writing *[Affirming]*, or you're just going to show
43   improvement in grammar? *[Clarifying]*

By situating her question in a past experience shared with Bill and within her own development as a writer, Amanda shifted the focus of the conversation from the immediate context of Martha's classroom (although she does refer to it in line 24) to a more theoretical conversation about the purposes of grammar instruction. As the teachers took up her question, the various members of the TRG drew upon a series of exploratory interchanges that addressed conventions, the importance of naming grammatical structures, the use of terminology to analyze writing, methods of instruction to analyze writing, the use of grammar check in word processing, and the processes writers use to identify errors in their writing. In order to explore these topics they drew upon the whole range of talk categories. However, in this conversation (by comparison to the conversation about Amanda's project), there was greater emphasis on redirecting the conversation and on imagining scenarios. With respect to the former, the teachers frequently redirected the conversation toward perspectives the group had not previously considered to add a new dimension to the conversation, and with respect to the latter, they engaged in the kinds of hypothetical reasoning implied in speculating and imagining.

The following excerpt, for example, opens with Valerie asking a reframing question about a topically related set of interchanges that focused on the need for students to be conscious about their uses of conventions:

44   Valerie: Right. *[Affirmation]* So, then the question becomes, why is it important?
45   *[Reframing]* And I am just going to use a sixth grade example from [my son], why is
46   it important to be able to label collective versus compound nouns? *[Explaining]*

47   Martha: Why do you have to know the difference between . . . *[Clarifying]*

48   Valerie: Why is that important? *[Explaining]*

49   Colleen: Why is knowing that terminology and . . . *[Explaining]*

50   Valerie: . . . and being able to put CL or CN in the blank before the sentence that has
51   the underlined noun in *[Explaining]*

52   Martha: Why do you have to know the difference between collective noun?
53   *[Clarifying]*

54   Valerie: Especially if the teacher doesn't really even know. *[Redirecting]*

55   Colleen: Well, but that is a different question, that is a different question. *[Redirecting]*

56   Amanda: But, I mean, how does that improve their writing? *[Redirecting]* But, that is
57   what I am saying, how does knowing the difference between those things going to
58   improve their writing? *[Explaining]*

Valerie's reframing question not only changed the focus of the conversation but also asked the group to consider the whole notion of identifying grammatical structures

by drawing on an assignment her son had recently completed in school. For the next five conversational turns, Valerie and Colleen restated the question in response to Martha's apparent uncertainty about the meaning of Valerie's question. Valerie then shifted the focus again, this time focusing on the activity in relation to the teacher's knowledge of the concepts. Colleen objected that Valerie's last comment changed the focus (again) and questioned its relevance to the current topic. Finally, Amanda redirected the topical focus to her original question about the relationship between grammar instruction and students' writing. This series of interchanges illustrates how the group used redirecting and reframing questions to add new perspectives to the conversational mix and to underscore the complexity of the topic. By questioning the underlying premise, that students should be able to name parts of speech, both Valerie and Amanda moved the conversation away from Martha's immediate context toward a more theoretical one that asked Martha (and the group) to reconsider the broader purposes of grammar instruction.

Following this excerpt, the TRG members drew upon the related topics of the purpose and importance of grammatical understanding to provide Martha with advice about her research project. They concentrated on the potential of peer response groups for investigating whether or not students were using terminology they had learned in grammar lessons in their discussion of their peers' written texts. This topic also spurred a discussion about students' knowing how to use grammatical structures without being able to identify them and whether or not naming parts of speech were included in the state standards. Again, Valerie opened the conversation with a clarifying question that she then answered:

44 Valerie: Can you use those things without labeling them? *[Clarifying]* Yes, I think
45 you can. *[Explaining]*

46 Colleen: Most people do. Kids certainly do everyday. *[Explaining]*

47 Valerie: I asked the people at [district writing institute] this summer if they could
48 define subordinate clause. (To Bill) What, there was one person . . . *[Reporting]*

49 Bill: Yeah. *[Affirming]*

50 Valerie: . . . in the whole room who could do it, but could those people write? Yeah.
51 *[Reporting]*

52 Colleen: And, could they use subordinate clauses? *[Clarifying]*

53 Valerie: Oh, they used them like crazy, but they had no idea what one was. *[Reporting]*
54 They could not have underlined, if I said, "OK, go through your piece and underline
55 your subordinate clauses," they would have been totally lost. *[Speculating]*

56 Amanda: Shut me down right away. You know what I mean, shut down immediately.
57 *[Affirming]*

58 Valerie: And, if I want kids to know that term because I am going to say, "We are
59 going to learn how to punctuate . . . *[Imagining]*

60   Martha: . . . punctuate it *[Affirming]*

61   Valerie: Right, OK, *[Affirming]* then I can define it right then while we are doing that,
62   and they can look in their papers, and they can find them. *[Imagining]*

63   Martha: "And look for these words that" . . . *[Imagining]*

64   Valerie: Right. *[Affirming]* And I could put up a list of subordinate conjunctions if I
65   want to. *[Affirming]*

Centered on the distinction between what writers can name and what they can use, this interchange between Amanda, Valerie, and Martha demonstrated how teachers' knowledge building drew upon previous experiences and extended to imagined practices with students to suggest an instructional means of approaching grammar instruction. Valerie began with an experience from a summer workshop with teachers, indicating that even adults have difficulty with abstract concepts even though they use them in their own writing, a point that Amanda (who also facilitated the workshop) affirmed. Valerie then described an imagined lesson she might conduct with students. Martha's turns on line 60 and 63 are of special note because they illustrate how she joined in the construction of this imaginary scenario, appropriating, in a manner of speaking, the narrative world that Valerie had created. Thus, Martha entered into to Valerie's representation of the lesson as a means of building her own.

The discussion of grammar extended over more than twenty pages of transcript and represented a joint effort to construct a representation of the purposes of grammar instruction. It engaged the TRG members in patterns of talk distinct from the conversation about Amanda's project in two ways. First, the TRG was not focused specifically on Martha's classroom but on a more general notion of grammar instruction. Second, the patterns of talk emphasized reframing questions to direct the conversation continually in new directions (which also accounts, in part, for its length). Although the group came to no definitive conclusions at the end, the process of the conversation provided opportunities to transform and re-organize how each member understood the relationship between grammar and writing instruction. They accomplished this knowledge building by sharing possible classroom worlds, by asking questions that required revising previous conceptions, and by drawing on and relating prior experiences. In this sense, the group was engaged in theory building as well as problem-solving.

Conclusions/Implications

Both of the conversations explored in this essay suggested how teachers used talking in a TRG to expand and enlarge their understandings of teaching and learning. Asking questions, explaining their ideas, reporting their activities, and imagining new teaching practices, they developed a shared mental context through which they built knowledge of each other's classroom contexts, as well as new

knowledge about the theoretical constructs that informed their work. The patterns of discourse involved participants in two distinct forms of collaborative knowledge building. The discussion of Amanda's project focused the group toward building a joint representation of Amanda's classroom, her students, and the instructional problem she faced to gain a better "picture," so to speak, of her students' mathematical abilities, and it offered support for both the instructional changes she had implemented and the modifications her new plans would require for her research. The discussion of Martha's project led to transformation and reorganization of the individual members' representations of grammar instruction through a series of reframing questions, each of which invited the participants to consider different perspectives. The group used Martha's opening questions about practice as an invitation to explore her questions from a more abstract vantage point that had relevance and interest to all the members of the group.

In a broader sense, these discussions serve as exemplars of the complex knowing that characterizes reflective practice. In both discussions, the teachers engaged in "the process of justifying beliefs through reasoning, conjecturing, evaluating evidence, considering counter-arguments, and so on," the integral elements of "the activity of knowing" described by Wells (1999, p. 89). Further, these teachers' practices also take place in specific contexts that complicate their research questions and shape their talk, providing the backdrop for their understandings. Perhaps the most important lesson from this study centers on the ways that the teachers' situational knowing becomes available for analysis through groups, such as the TRG, because such analysis illustrates how exploring questions deepens and enriches understanding and sets the stage for transforming practice. In each of these two examples, the questions are treated as significant, the intricacies of teaching are valued, and the talk leads to plans for action based on information and analysis. Through such processes, teachers learn and teaching is transformed.

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